

**The COYOTE Project: Development of
Monitoring and Analytical Methods for
Floodplain and Freshwater Tidal Marsh
restoration in the Cosumnes Preserve and
Yolo Bypass**

Randy Mager

Public Comments

No public comments were received for this proposal.

Collaboration Panel Review

Proposal Title

#0234: The COYOTE Project: Development of Monitoring and Analytical Methods for Floodplain and Freshwater Tidal Marsh restoration in the Cosumnes Preserve and Yolo Bypass

Final Panel Rating
adequate

Collaboration Panel (Primary) Review

Collaboration:

Will the results of the collaborative effort be greater than the sum of its parts? Is it clear why the subprojects are part of a larger collaborative proposal rather than several independent smaller ones?

above average

This proposal is the second part of a larger project. There are four project elements in total with two of them described in this proposal - forecasting and methods. It is not entirely clear if these two program elements add up to greater than the sum of the parts. For example, the modeling work described under the forecasting element will proceed using currently available data, and its link to the methods section is not articulated. The modeling work does not clearly describe what questions will be addressed with the model and their relationship to other program elements. The collaborative effort involves work across both the Yolo Bypass and the Cosumnes River and this combination promises to have a synergistic impact in that they are comparison sites (p.5). In addition, although this proposal represents a collaboration between DWR and UCD, the overall project is a collaboration between multiple groups, including CDFG, USFWS, TNC, the Cosumnes River Preserve Partners, etc (p.6).

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Interdependence And Integration:

Does the proposal have an example that clearly articulates the conceptual model of each subproject and how they link together as a whole? Are the boundaries of the study plans focused and cohesive, yet well delineated? Is there a plan for potential differences in the stages of subproject completion times? Are there clear plans for analyses and interpretations which seek to identify and quantify relationships among the data collected in various subprojects rather than separate analyses for each subproject?

above average

The proposal references 4 conceptual models (p.3)- ecosystem restoration, ecosystem restoration indicators and performance measures, monitoring design, study organization. All of these conceptual models are not provided, and thus cant be analyzed. Figures 5 and 6 are conceptual models which underlie restoration activities. Figure 7 is a conceptual model for the entire COYOTE study program. There are not conceptual models for each of the proposed subprograms, but Figure 7 moves in that direction. In addition, the questions on page 7 of the proposal outline how the program elements are combined inot common questions. In terms of a plan for each of the program elements, the first two program elements are under consideration for funding from the ERP program. The proposal states (p.3) that the two elements described in this proposal are "stand-alone" and dont depend on funding for the first two. Although on page 7, forecasting and methods elements are combined with the first two elements to answer common questions. There are plans for a "mega synthesis" (p.16) to not only combine results from the COYOTE project, but also to integrate these results with the BREACH III study.

Project Management:

Is it clear who will be performing management tasks and administration of the project? Are there resources set aside for project management and time given for investigators to collaborate? Is there a process for making decisions during the course of the project? Are there acknowledgments of potential barriers to collaboration and explanations of how team members will overcome barriers particular to their institutions?

above average

Through designating task 1 as project management, the proposal

Collaboration Panel Review

clearly recognizes the need for project management and coordination tasks. In addition, under the personnel section, one person from DWR (PI) and one person from UCD (analyst) have management roles assigned to them. In addition, the management team is discussed in the proposal (p.7) and mentions quarterly management meetings. The proposal also states that DWR and UCD would require separate contracts. Although there is a UCD analyst listed in the personnel section, there is no funding for that person in the budget. \$31,000 out of \$880,949 is allocated for management. There is no funding explicitly designated for coordination, megasynthesis meeting, etc., nor is there discussion around potential barriers to collaboration.

Team Composition:

Does the lead principal investigator have successful management history and experience leading collaborative teams? Is it clear that all key personnel are committed to making significant contributions to the project? Do team members have complementary skills?

above average

It is not clear from the proposal if the PI, Dr. Mayer, has experience leading a collaborative team. His CV states that he is the Program Manager for the Liberty Island Monitoring Program, but the scale of collaboration required in that effort is not discussed. The key personnel are named and appear committed based on the amount of detail provided regarding the various roles and responsibilities. In addition, their skills and experience appear to be complementary (p.23).

Communication Of Results:

Is there a clear plan for comprehensive and cohesive reporting of project progress to the CALFED community?

above average

There is extensive discussion regarding reporting and outreach (p.16-19, Table 4) that goes beyond just reporting to CALFED. There is funding in the budget for attending conferences, but no obvious funding allocated for the outreach described. Deliverables are clearly described in the task description.

Additional Comments:

Collaboration Panel (Discussion) Review

Primary reviewer, although seeing evidence of much collaboration described in the proposal, found it difficult to decipher the plan. Secondary reviewer agreed on the same point: proposal was confounding to read. In addition, although three principals listed in the proposal were donating time for the project, there was no identification of how much time of each would be committed to the tasks.

Technical Synthesis Panel Review

Proposal Title

#0234: The COYOTE Project: Development of Monitoring and Analytical Methods for Floodplain and Freshwater Tidal Marsh restoration in the Cosumnes Preserve and Yolo Bypass

Final Panel Rating
adequate

Technical Synthesis Panel (Primary) Review

TSP Primary Reviewer's Evaluation Summary And Rating:

The goals of this proposal are to establish an integrated, long-term monitoring plan for the Cosumnes Preserve and Yolo Bypass that (1) assess the responses of ecosystems to management and hydrologic change, (2) develops performance measures to evaluate restoration progress, (3) supports adaptive management for ongoing restorations, and (4) develops new tools and methods for monitoring and evaluation. "Connectivity" is a central theme of the proposal, but is never adequately defined. Although the two proposals are said to be independently valuable, activities and expected results of the two proposals (one to TSP and one to ERP) are difficult to discern (see p. 7). In fact, appreciable portions of this proposal are devoted to elements that are supposedly contained in the other proposal (e.g., Table 3), making it difficult to discriminate the efforts. Quantifying relations between hydrologic regimes and benthic primary and secondary production in a dynamic floodplain is an important and challenging goal. Given the huge difficulties of sampling and integration, such an effort has probably never been accomplished, and a successful project would serve as a prototype for many to follow. However, as written, this proposal does not provide a clear plan for achieving that

Technical Synthesis Panel Review

goal. The stated hypotheses are so broad that they are not testable (see top of p. 10, and p. 13, par. 4). Consequently, the adequacy of the methods is difficult to judge, as would be the success of the project after its completion. Parts of the proposal dealing with hydrology modeling and remote sensing are highly jargonized, making it difficult to evaluate intuitively what will be done (see p. 8-9). It is unclear how the approach in the Terrestrial Resources component (entirely remote sensing information) will adequately address the hypothesis for that component program. A surprising omission is that nothing is said about bathymetry as an important component of models of flooding effects on biota. One potential weakness of the proposal is the comparison between "altered, but like systems" for assessment. Unlike the authors' assertions, this is very different from a Before-After Control-Impact (BACI) design. The assumption is that if similar management strategies occur in the two areas, similar results will be produced. While this approach seems logical, when there are only two reference sites, this approach becomes much weaker. If results differ between areas, what can really be concluded? Even if the results are similar, it will be difficult to fully grasp the reasons underlying the similarities. One reviewer asked why only birds, benthos, and fish are included, omitting consideration of mammals and amphibians. All sampling of benthic algae and benthic invertebrates will be done on artificial substrates, which are often of limited value especially for epiphytic invertebrates. In complex floodplains and marshes, much of the variation among habitats results from variation in habitat structure and differential functioning of plants and sediments - thus, artificial substrates would miss the most important aspects of variation among habitats. All organisms above the sediments including macrophytes will be sampled with an "extended coring device," whose construction and dimensions are not described. No details are given as to how invertebrate samples will be collected or processed. A serious concern is that there is no explanation of how spatial and temporal variability will be dealt with from a sampling perspective. A floodplain is an extremely patchy habitat in space and time, with widely fluctuating water levels that produce widely fluctuating habitats. What if various pools of water that remain as

Technical Synthesis Panel Review

floodwaters recede do not occur in areas where the artificial substrate arrays are in place? Such an environment requires that sampling be highly mobile and opportunistic in space and time, which is indeed a serious challenge for standardized monitoring. Overcoming this sampling challenge is perhaps the most critical unsolved problem in this effort, but this issue is never mentioned in the proposal. Finally, it is not at all apparent how the different components of the project will be integrated into a predictive model. To know if the data will be collected in a way compatible with the model, a description of how this model will be constructed is needed. The performance of the PIs in terms of research productivity is uneven. In the proposal, many of the references cited as evidence of research productivity are theses and dissertations, not published papers. Also, many references in the proposal are not listed in the references section. This proposal may be better suited for the Ecosystem Restoration Program than the Science program, as it contains little investigational component to improve basic knowledge.

Additional Comments:

On p. 22, par. 2 is mentioned a recently completed study of primary productivity in the Yolo Bypass that seems similar to the one you propose. What do you expect to learn that is different? The budget of \$881 K seems reasonable if the PIs were to accomplish all they intend to. However, there is no clear organizational framework for accomplishing their objectives, which are in fact only vaguely defined.

The goals of this proposal are to establish an integrated, long-term monitoring plan for the Cosumnes Preserve and Yolo Bypass that (1) assess the responses of ecosystems to management and hydrologic change, (2) develops performance measures to evaluate restoration progress, (3) supports adaptive management for ongoing restorations, and (4) develops new tools and methods for monitoring and evaluation.

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of the two proposals (one to TSP and one to ERP) are difficult to discern (see p. 7). In fact, appreciable portions of this proposal are devoted to elements that are supposedly contained in the other proposal (e.g., Table 3), making it difficult to discriminate the efforts. Quantifying relations between hydrologic regimes and benthic primary and secondary production in a dynamic floodplain is an important and challenging goal. Given the huge difficulties of sampling and integration, such an effort has probably never been accomplished, and a successful project would serve as a prototype for many to follow. However, as written, this proposal does not provide a clear plan for achieving that goal. The stated hypotheses are so broad that they are not testable (see top of p. 10, and p. 13, par. 4). Consequently, the adequacy of the methods is difficult to judge, as would be the success of the project after its completion. Parts of the proposal dealing with hydrology modeling and remote sensing are highly jargonized, making it difficult to evaluate intuitively what will be done (see p. 8-9). It is unclear how the approach in the Terrestrial Resources component (entirely remote sensing information) will adequately address the hypothesis for that component program. A surprising omission is that nothing is said about bathymetry as an important component of models of flooding effects on biota. One potential weakness of the proposal is the comparison between "altered, but like systems" for assessment. Unlike the authors' assertions, this is very different from a Before-After Control-Impact (BACI) design. The assumption is that if similar management strategies occur in the two areas, similar results will be produced. While this approach seems logical, when there are only two reference sites, this approach becomes much weaker. If results differ between areas, what can really be concluded? Even if the results are similar, it will be difficult to fully grasp the reasons underlying the similarities. One reviewer asked why only birds, benthos, and fish are included, omitting consideration of mammals and amphibians. All sampling of benthic algae and benthic invertebrates will be done on artificial substrates, which are often of limited value especially for epiphytic invertebrates. In complex floodplains and marshes, much of the variation among habitats results from variation in habitat structure and

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differential functioning of plants and sediments - thus, artificial substrates would miss the most important aspects of variation among habitats. All organisms above the sediments including macrophytes will be sampled with an "extended coring device," whose construction and dimensions are not described. No details are given as to how invertebrate samples will be collected or processed. A serious concern is that there is no explanation of how spatial and temporal variability will be dealt with from a sampling perspective. A floodplain is an extremely patchy habitat in space and time, with widely fluctuating water levels that produce widely fluctuating habitats. What if various pools of water that remain as floodwaters recede do not occur in areas where the artificial substrate arrays are in place? Such an environment requires that sampling be highly mobile and opportunistic in space and time, which is indeed a serious challenge for standardized monitoring. Overcoming this sampling challenge is perhaps the most critical unsolved problem in this effort, but this issue is never mentioned in the proposal. Finally, it is not at all apparent how the different components of the project will be integrated into a predictive model. To know if the data will be collected in a way compatible with the model, a description of how this model will be constructed is needed. The performance of the PIs in terms of research productivity is uneven. In the proposal, many of the references cited as evidence of research productivity are theses and dissertations, not published papers. Also, many references in the proposal are not listed in the references section. This proposal may be better suited for the Ecosystem Restoration Program than the Science program, as it contains little investigational component to improve basic knowledge.

Technical Synthesis Panel (Discussion) Review

TSP Observations, Findings And Recommendations:

The COYOTE Project: Development of Monitoring and Analytical Methods for Floodplain and Freshwater Tidal Marsh Restoration in the Cosumnes Preserve and Yolo Bypass

Technical Synthesis Panel Review

The panel agreed with the primary reviewer's analysis and comments.

The quantification of benthic primary and secondary production in this heterogeneous and dynamic system presents difficult sampling problems that were insufficiently addressed by the proponents. Using artificial substrates to sample benthos is unsatisfactory in an environment in which the biota depends strongly on complex vegetative structure and sediment processes. In a system where flooding is highly patchy in space and time, the sampling has to be mobile and opportunistic. However, stationary artificial substrates will be used. The operation and attributes of the extended coring device that would be used for benthic sampling was not described in enough detail.

In addition, bathymetry was not mentioned as an important variable in the hydrologic modeling.

The proposed work was considered very ambitious, but many sampling details were left out. This proposal does not fit the Science Program well, and would seem more suitable for ERP.

Restoring connectivity is a central premise for doing the project, but it is inadequately defined in the proposal.

A major concern with the design was that although this was presented as a modified BACI design (before and after with control) by the PIs, the control part was not included in the design, so it is not a BACI at all.

Rating: adequate

Technical Review #1

proposal title: The COYOTE Project: Development of Monitoring and Analytical Methods for Floodplain and Freshwater Tidal Marsh restoration in the Cosumnes Preserve and Yolo Bypass

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	Yes, all 3 are clearly stated and consistent. The idea is timely and its importance will depend on the quality of the research project. Information on aquatic and terrestrial foodwebs in the Delta and their response to manipulations of the hydrograph is essential to maintain healthy biological populations.
Rating	very good

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Comments	Yes the study is justified relative to existing knowledge and a conceptual model is clearly stated. The research is justified though perhaps it could be scaled back.
Rating	very good

Technical Review #1

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	Yes the approach is well designed, appropriate, and feasible. The results are likely to add to the base of knowledge dealing with flood plains and fresh tidal marsh ecosystems. The evaluation of seasonal and interannual variation in climatic and hydrologic conditions with respect to connectivity should be useful to decision makers involved with aquatic and terrestrial resources and water quality.
Rating	very good

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	Yes the approach is fully documented for the 3 subjects (hydrology, aquatic, and terrestrial resources)and appears to be feasible (though it is difficult to judge that without knowledge of the sites and the other studies that have occurred here). If the data collected and used in the hydrologic model is adequate, the liklihood of success should be high in terms of predicting the effects of hydrologic changes to the affected ecosystems.
Rating	very good

Monitoring

If applicable, is monitoring appropriately designed (pre–post comparisons; treatment–control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Technical Review #1

Comments	The project proposes to use comparisons between altered but similar systems since only limited baseline data and no in tact reference sites are available. The study will assume that similar management strategies can produce similar responses in the two project sites under investigation, and this appears to be a reasonable approach. An adequate number of samples and sampling frequency will be investigated to assure that natural variation is considered in the response of the variables to the treatments in the two ecological systems.
Rating	excellent

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	Yes products are likely to be valuable. Yes contributions to existing studies, including the BREACH studies, are considered and, if the variables are adequately controlled, interpretive outcomes are likely from the project.
Rating	very good

Additional Comments

Comments	The food web includes aquatic and terrestrial species, but only birds, benthos, and fish. Why isn't an entire food chain considered by including mammals, amphibians and reptiles? If management decisions are made for some species groups, then the implications should be at least suggested for the other biological groups, even if surveys and analysis cannot be extensive for all affected groups.
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Technical Review #1

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	The track record of the authors looks good in terms of past performance, and the infrastructure appears sound (but there may be too many people involved).
Rating	very good

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	It is hard to evaluate this without a firm knowledge of what is involved but the budget seems very high and one wonders if the same amount of work could be done with fewer people. Academic overhead is very high and it may be that costs would be less using outside consultants (but perhaps not).
Rating	good

Overall

Provide a brief explanation of your summary rating.

Comments	This is a well-designed proposal to establish a long-term monitoring program which would benefit Central Valley restoration projects and probably state and national projects as well with new knowledge on aquatic and (limited) terrestrial food webs and their response to management and hydrologic changes.
Rating	excellent

Technical Review #2

proposal title: The COYOTE Project: Development of Monitoring and Analytical Methods for Floodplain and Freshwater Tidal Marsh restoration in the Cosumnes Preserve and Yolo Bypass

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	Goals: The goals and objectives, "methods development" and "develop a hydrologic model for Yolo Bypass" are clearly stated on page 3, 2nd paragraph. No explicit hypotheses are presented. Score=3 (Good)
Rating	good

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

Comments	Justification: This proposal is clearly a monitoring study. There is no well defined conceptual model (Figure 5 is not a well-defined conceptual model) or testable hypotheses. Score=4 (Fair)
Rating	fair

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be

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Technical Review #2

useful to decision makers?

Comments	Approach: The sampling schedule and protocols are clearly laid out. The focus on Methods development (i.e. sampling protocols and methods) seems unnecessary as there are plenty of acceptable and well established methods in the literature. Score=4 (Fair)
Rating	fair

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success?
Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	Feasibility: The project is technically feasible with many personnel involved in the work. Score=2 (Very Good)
Rating	very good

Monitoring

If applicable, is monitoring appropriately designed (pre–post comparisons; treatment–control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	Monitoring: There is plenty of monitoring in this proposal. Score=1 (Excellent)
Rating	excellent

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	Products: A hydrodynamic and water quality model will be developed for Yolo Bypass. Score=3 (Good)
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Technical Review #2

Rating	good
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Additional Comments

Comments

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	Capabilities: The performance of the PI's in terms of research productivity and publications is uneven. In the proposal, many of the references cited as evidence of research productivity are theses and dissertations. Also, many references cited in the proposal are not listed in the references section. Other PI's on the proposal have well established track records. Also, institutional support is strong. Score=2 (Very Good)
Rating	very good

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	Budget: The budget seems reasonable in view of the large number of personnel involved. It is not clear to this reviewer how this proposal differs from the proposal listed on page 5, The COYOTE Project: A Unified Approach to Monitoring Freshwater Tidal Marsh Restoration in the Cosumnes Preserve and Yolo Bypass. It seems that both proposals focus on monitoring of the same areas. Score=2 (Very Good)
Rating	very good

Technical Review #2

Overall

Provide a brief explanation of your summary rating.

Comments	Overall: The proposal is a monitoring study of the Cosumnes Preserve and Yolo Bypass areas. It is not clear how all of this monitoring will advance basic knowledge or improve management of these wetland-floodplain-aquatic complexes. Also, the work proposed in this study is not clearly distinguished from the monitoring activities proposed in the other COYOTE project. For these reasons, I rate this proposal as fair. Score=4 (Fair)
Rating	fair